a survey is obvious not only to the man of science, but to the technical leather trades chemist who is always seeking some new tanning material in view of the probable early exhaustion of some of the materials now in common use. A chapter on the physiological *rôle* played by the tannins in the plant concludes the botanical part of the book, and gives a very interesting account of the work done on this difficult subject.

The researches of Emil Fischer and his pupils on the chemistry of the tannins have robbed the earlier work on the subject of much of its interest, and the author might have gone further in cutting down his account of this older work, which will only rarely bear criticism and is scarcely ever suggestive of further work. This applies even to the formula which the author himself suggested for gallotannic acid,

$$C_6H_2(OH_3).C(OH).O.CO.C_6H(OH)_3,$$

a constitution which is merely the tautomeric form of that suggested by Böttinger for oakwood tannic acid,

$$C_6H_2(OH)_3.CO.C_6H(OH)_3.COOH.$$

This fact is not alluded to by Dr. Dekker, or by other authors who have discussed Dekker's formula.

An excellent bibliography of tannin literature, comprising all books published since 1571, and all papers since 1754, forms one of the most valuable features of the book. All who intend working on the chemistry or chemical technology of tannins will find here a valuable guide to original work on the subject. Dr. Dekker also gives accounts of no fewer than eighty-six methods of tannin analysis. This part of his book is of great interest to leather trades chemists. The same cannot be said of the chapter on practical tanning, which would have been better omitted.

Dr. Dekker's book can be thoroughly recommended to all botanists, chemists, or technologists who are specially interested in vegetable tannins, as it is certainly the best and most complete account existing of our knowledge of these bodies.

E. S.

WIRELESS TELEGRAPHY.

(1) *Text-book on Wireless Telegraphy.* By Prof. R. Stanley. Pp. xi+344. (London: Longmans, Green and Co., 1914.) Price 7*s*. 6*d*. net.

(2) *Wireless Telegraphy: a Handbook on the Fundamental Principles and Modern Practice of Radio-telegraphy.* By A. B. Rolfe-Martin. Pp. vi+256. (London: A. and C. Black, 1914.) Price 5*s*. net.

THE literature of wireless telegraphy has already become very extensive although the art and practice of the subject is scarcely more than fifteen years old. Leaving out of account the large number of original memoirs on the scientific side, we can say that broadly speaking the books written on the subject fall into three groups. There are first a few which deal in an advanced manner with the scientific exposition of it, making free use of whatever mathematical analysis may be required, and assuming on the part of the reader a sufficient preliminary acquaintance with physics. Then at the other end of the bookshelf we find a large number of smaller books which aim chiefly at imparting to the amateur or practical operator a knowledge of the use of the appliances and instructions for making or operating wireless telegraph apparatus. An intermediate group of books comprises the student's text-books, which, whilst giving descriptions of apparatus, endeavour to impart a certain degree of explanation of its operation suited to those whose acquaintance with mathematics or physics is limited. The two books before us belong to the latter class.

(1) Prof. Rupert Stanley's book is marked by a certain novelty of treatment and originality in illustrations. He has not been content merely to appropriate diagrams which have done duty already in other books, but has prepared with considerable care diagrams of circuits and schemes of connections of apparatus in which the nature of the magnetic and electric fields is clearly denoted. This feature is of distinct assistance to the student coming to the subject for the first time. Also he has judiciously abandoned the usual practice of describing wireless apparatus arranged under various "systems" ascribed to particular inventors, and has grouped the information in chapters comprising descriptions of particular elements in the apparatus.

The first seven chapters of the book are devoted to an exposition of the elements of electrical and electrical engineering knowledge, to which, however, utility is imparted by basing it on the electronic theory. There is no doubt that this method is a useful one. The student is in this manner enabled to visualise some of the operations better, but the teacher should at the same time be careful to point out that there can be no finality in any of our explanations of Nature's processes. Because we can conceive a mechanism by which the effects we see are brought about it does not in the least degree follow that they are actually done in that manner. A commendable feature of the book is a series of questions at the end of each chapter which will aid the teacher in testing the results of his teaching.

Some of the explanations in the book might with advantage have been amplified. For instance, in the description of Goldschmidt's high-frequency alternator no explanation is given of the

© 1915 Nature Publishing Group

reason the non-used lower harmonic frequencies do not dissipate energy to such an extent as greatly to lower the over-all efficiency of the machine. Otherwise the book will prove to be a useful text-book for class teaching for students who come to the subject without much previous knowledge. The book is well printed, and the illustrations are well selected and drawn. The diagram No. 54, representing the lines of electric force round a Hertzian oscillator, is, however, not very true to fact. The loops of force thrown off should be concave on the inner side, and not convex.

(2) The book by Mr. Rolfe-Martin covers much the same ground, but is marked by less originality of illustration and more dependence on diagrams borrowed from commercial publications or magazines than is the case with Prof. Stanley's book. It is also more occupied with descriptive matter of the various appliances used by the Marconi Company, the Telefunken Company, and others. Nevertheless, it is well up-to-date, and for the student who can afford to possess more than one book on wireless telegraphy it is useful to have illustrations of actual apparatus in various forms.

Books which aim chiefly at an exposition of first principles rather than at descriptions of apparatus are likely to have more permanent value because the principles remain, whereas types of apparatus are being perpetually changed. In both of the above-mentioned books the authors have done wisely to discard all reference to early and now antiquated forms of wireless telegraphy. Neither of them, however, devotes much space to the consideration of the problem of radio-telephony.

There is here a wide field yet open for invention. The invention of a simple, easily managed generator of undamped waves and mode of modulating their amplitude in accordance with the wave form of the speaking voice offers a large scope for invention, and one which, if successfully cultivated, may end in replacing radio-telegraphy by radio-telephony to much the same extent as the telephone has replaced the telegraph in the case of wire transmission.

It need scarcely be said that in books intended for students there is no reference made in these publications to the outstanding problems and difficult questions of radio-telegraphy. The mode of propagation of the waves over the earth's surface is, however, dealt with by Prof. Stanley in his tenth chapter in a manner sufficient to impart some ideas of the nature of it as well as of the causes of the variations observed. It is becoming more and more clear that our terrestrial atmosphere plays an important part in long-distance radio-telegraphy, and that if the earth were a good conductor, say, as good as copper, and possessed no atmosphere, anything like long-distance wireless telegraphy on it would probably be impossible.

The progress of real knowledge on this subject will therefore be to a large extent conditioned by the progress of atmospheric meteorology and a knowledge of the state and constitution of the upper air.

J. A. F.

TRANSLATIONS OF POINCARE ON METHOD.

(1) *Science and Method.* By Henri Poincaré. Translated by Francis Maitland. With a Preface by the Hon. Bertrand Russell. Pp. 288. (London: Thomas Nelson and Sons, n.d.) Price 6*s*. net.

(2) *The Foundations of Science: Science and Hypothesis; The Value of Science; Science and Method.* By H. Poincaré. Authorised translation by G. B. Halsted. With a special Preface by Poincaré, and an Introduction by Josiah Royce, Harvard University. Pp. xi+553. (New York: The Science Press, 1913.)

(3) *Wissenschaft und Methode.* Von Henri Poincaré. Autorisierte deutsche Ausgabe mit erläuternden Anmerkungen von F. und L. Lindemann. Pp. vi+283. (Leipzig und Berlin: B. G. Teubner, 1914.) Price 5 marks.

(4) *Letzte Gedanken.* Von Henri Poincaré. Mit einem Geleitwort von Wilhelm Ostwald. Uebersetzt von Dr. Karl Lichtenecker. Pp. v+261. (Leipzig: Akademische Verlagsgesellschaft, M.B.H., 1913.) Price 4.50 marks.

DURING his lifetime Henri Poincaré published many articles on the philosophy of science, and these were republished in three books: "La Science et l'Hypothèse," "La Valeur de la Science," and "Science et Méthode." After his death, his "Dernières Pensées" were collected and published in 1913. Of the books under review, (1) gives an English translation of the third of Poincaré's works just mentioned; (2) the first volume of a series on science and education, gives an English translation of the first three; (3) gives a German translation of the third; and (4) gives a German translation of the posthumous work.

Poincaré's lively style is very well reproduced in (1), but in (2) the translation seems to aim at the French spirit, and succeeds in giving an almost comically literal rendering which is not English and not even American. We will reproduce parallel passages of both books to show

© 1915 Nature Publishing Group